

Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management
Policy and Procedures

Subject: Policy concerning the default background concentration of arsenic and revision to the **Remediation Standards Guidance**

Issued: February 2007

The Department of Natural Resources and Environmental Control-Division of Air and Waste Management adopts this policy to modify the **Remediation Standards Guidance under the Delaware Hazardous Substance Cleanup Act 1999 (RSG)** with respect to the default background concentration of arsenic.

Purpose

The purpose of this policy is to align the state's default background concentrations, to be used in some cases as a cleanup standard for contaminated soil, based on the results of technical review and analysis conducted by DNREC since 2005, in coordination with other Delaware state agencies and other state, federal and international scientific analysis. In June 2005, Gov. Minner directed DNREC to "review...and propose appropriate standards and policies" for arsenic in soil. In June 2005, DNREC released the *Proposed Arsenic Risk Management Plan* which included technical background information on arsenic and summarized policy options. That document also established an *interim default background concentration* for arsenic in soil of 11 milligrams per kilogram (mg/kg). DNREC then conducted public meetings on the proposal and collected numerous written and verbal comments. This policy is the outcome of that public review process.

This policy provides the revised technical guidance to DNREC's staff for conducting cleanups and establishing acceptable risk levels under the **Regulations Governing Hazardous Substance Cleanup** [Section 9.4 *Soil Cleanup Levels*]. These HSCA regulations provide the overall requirements for ensuring protection of public health and the environment. In the case of arsenic, however, the technical guidance is particularly important because it is among a number of naturally-occurring mineral for which average background soil concentrations exceed the soil concentrations associated with the acceptable cumulative lifetime incremental risk established in HSCA regulations of 10E-5 (one-in-one hundred thousand).

The revised default background concentration of 11 mg/kg for arsenic in soil necessitates a revision to approved statistical tests for demonstrating attainment with cleanup goals or background concentrations described in the **RSG** Section 6.2.

Policy

1. The **RSG** Attachment 3 "Delaware Default Background Remediation Standards" shall be revised. The new default background remediation standard for arsenic in soil shall be 11 mg/kg.

**DELAWARE DEFAULT BACKGROUND REMEDIATION STANDARDS
(REVISION TO ATTCHMENT 3, REMEDIATION STANDARDS GUIDANCE)**

Revised February 2007

Default Background Standard						
Contaminant	CAS	Ground Water (a)	Soil (b)	Surface Water (c)	Sediment (d)	Typical Delaware Soil Concentrations (h)
		µg/L	mg/kg	µg/L	mg/kg	mg/kg
Aluminum	7429905	200	7800(e)	200	7800	4,800-12,000
Antimony	7440360	6	<0.5	6	<0.5	<0.5
Arsenic	7440382	1	11	1	0.4	11(i)
Barium	7440393	4(f)	82	4(f)	20	40-80
Beryllium	7440417	0.7	10(e)	0.7	0.5	0.6-1.0
Cadmium	7440439	1(f)	3	1(f)	1(g)	1-3
Chromium(III)	16065831	100	0.4	100	81	5-30
Cobalt	7440484	23	20	23	20	4-13
Copper	7440484	12(f)	50	12(f)	34(g)	15-40
Iron	7439896	300	2300(e)	300	2300	3,000-22,000
Lead	7439921	15	41	15	47(g)	30-100
Manganese	7439965	50	180(e)	50	180	60-350
Mercury	7439976	0.4	0.0005	0.4	0.2(g)	0.1-0.3
Nickel	7440020	100	30	100	21	5-15
Selenium	7782492	20(f)	0.2	20(f)	0.2	0.1-0.5
Silver	7440224	0.4(f)	2	0.4(f)	1	1-2
Thallium	7440280	2	1	2	1	1
Tin	7440315	73(f)	12	73(f)	12	3-12
Vanadium	7440622	19(f)	2(e)	19(f)	2	15-40
Zinc	7440666	110(f)	8(e)	110(f)	150	60-90
Organic Compounds (all)	Lowest Available Practical Quantitation Limit (PQL)					

* - USERS ARE ENCOURAGED TO DEVELOP SITE-SPECIFIC BACKGROUND STANDARDS TO ADDRESS SITE-SPECIFIC CONSIDERATIONS WHERE THE DEFAULT STANDARD MAY NOT BE APPLICABLE OR APPROPRIATE

* - NOTE THAT ALL OF THE DEFAULT VALUES ARE EXPECTED TO BE UPDATED IN THE FUTURE TO BE MORE STATISTICALLY REPRESENTATIVE OF DELAWARE CONDITIONS

(a) Ground-water values are a combination of ground-water URS and surface water URS, whichever are more stringent.

(b) Soil values are upper value of the concentration range detected in background samples collected statewide. Note that these soil values are expected to be updated to be more statistically representative of Delaware conditions in the future.

(c) Surface water values are a combination of ground-water URS and surface water URS, whichever are more stringent (dissolved data).

(d) Sediment values are a combination of the default background soil criteria and sediment URS, whichever are more stringent.

(e) Value presented is the most stringent soil URS value because the upper value of the concentration range (as described in item (b)) exceeds the unrestricted soil URS or the environment URS.

(f) Value presented is the surface water URS

(g) Value presented is the sediment URS

(h) The range of soil background values from representative sites in Delaware are provided for information only and are not default background standards. This information can be used to evaluate if the development of site-specific background standards is appropriate or useful.

(i) Value is the 95% UCL of the mean of a state-wide background data set

- All soil and sediment values are dry weight basis

- All ground-water values are either total (water supply source) or dissolved (monitoring well) concentrations, depending on the application.

The same attachment contains a column heading, *Typical Delaware Soil Concentration*, with the note that "The range of soil background values from representative sites in Delaware are provided for information only and are not default background standards. This information can be used to evaluate whether the development of site-specific background standards is appropriate or useful." Based on the review of state-wide background studies during the Arsenic Management Plan process, the listing for arsenic is updated to 11 mg/kg.

2. The "75/10/2 Rule" described in Section 6.2 of the **RSG** is no longer valid for screening arsenic in soil against the default background concentration. It remains acceptable for other inorganic chemicals.

This policy will be distributed to relevant DNREC staff and approved HSCA consultants and will appear on the DNREC-SIRB web page. The changes will appear in any new revision of the **Remediation Standards Guidance**.

DNREC will review the Default Background Remediation Standards including the information for arsenic at regular intervals not exceeding five years.

Approved by: _____

James D. Werner, Director
Division of Air and Waste Management

Date: _____

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